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UTILITY PATENT APPLICATION TRANSMITTAL

Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 35.G1872D

First Named Inventor or Application Identifier

YOSHINORI TAKAHASHI

Express Mail Label No.

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☐ Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification Total Pages 32

3. ☒ Drawing(s) (35 USC 113) Total Sheets 7

4. ☒ Oath or Declaration Total Pages 2

a. ☐ Newly executed (original or copy)

b. ☐ Unexecuted for information purposes

c. ☒ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 5 below]

i. ☐ DELETION OF INVENTOR(S)
Signed Statement attached deleting inventor(s)
named in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (useable if Box 4c is checked)
The entire disclosure of the prior application, from which a copy of the
oath or declaration is supplied under Box 4c, is considered as being
part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.

6. ☐ Microfiche Computer Program (Appendix)

7. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)

a. ☐ Computer Readable Copy

b. ☐ Paper Copy (identical to computer copy)

c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))

9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
(when there is an assignee)

10. ☐ English Translation Document (if applicable)

11. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations

12. ☒ Preliminary Amendment

13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)

14. ☐ Small Entity Statement(s) ☐ Statement filed in prior application
Status still proper and desired

15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)

16. ☐ Other: _____

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☒ Divisional ☐ Continuation-in-part (CIP) of prior application No. 08/782,817

18. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label

05514
(Insert Customer No. or Attach bar code label here)

or ☐ Correspondence address below

NAME

Address

City

State

Zip Code

Country

Telephone

Fax

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	1-20 =	0	X \$ 18.00 =	\$0.00
	INDEPENDENT CLAIMS (37 CFR 1.16(b))	1-3 =	0	X \$ 78.00 =	\$0.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			\$260.00 =	\$0.00
				BASIC FEE (37 CFR 1.16(a))	\$690.00
	Total of above Calculations =				\$690.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
	TOTAL =				\$690.00

19. Small entity status

- a. ☐ A Small entity statement is enclosed
- b. ☐ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.
- c. ☐ Is no longer claimed.


20. ☒ A check in the amount of \$ 690.00 to cover the filing fee is enclosed.

21. ☐ A check in the amount of \$ _____ to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

- a. ☒ Fees required under 37 CFR 1.16.
- b. ☒ Fees required under 37 CFR 1.17.
- c. ☐ Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

NAME	Leonard P. Diana (Reg. No. 29,296)
SIGNATURE	
DATE	February 11, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
YOSHINORI TAKAHASHI) Examiner: D. Popovici
Application No.: NYA) Group Art Unit: 2772
Division of S.N. 08/782,817 :
filed January 13, 1997)
Filed: Concurrently Herewith)
For: INFORMATION PROCESSING)
APPARATUS, INFORMATION :
PROCESSING METHOD, AND)
INFORMATION PROCESSING :
SYSTEM) February 11, 2000

Assistant Commissioner for Patents
BOX PATENT APPLICATION
Washington, D.C. 20231

PRELIMINARY AMENDMENT
AND
INFORMATION DISCLOSURE STATEMENT

Sir:

Prior to examination on the merits, please amend
the above-identified application as follows:

IN THE SPECIFICATION

At page 1, immediately after the title, insert

--This application is a division of Application No.
08/782,817, filed on January 13, 1997.--.

IN THE CLAIMS:

Please cancel Claims 2-44, without prejudice or disclaimer of the subject matter presented therein.

REMARKS

The present application is a division of copending Application No. 08/782,817, filed on January 13, 1997. Original Claim 1 remains pending in this application, and original Claims 2-44 have been cancelled, without prejudice or disclaimer of the subject matter presented therein. Applicants presently intend to file additional papers in this case shortly. Should the Examiner take this case up for action before receiving such papers, it is respectfully requested that the Examiner contact the Applicants' undersigned attorney.

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 C.F.R. § 1.56, Applicants respectfully direct the Examiner's attention to the documents listed on the enclosed Form PTO-1449.

Applicants also respectfully direct the Examiner's attention to Application No. 08/076,785, filed June 15, 1993, which was cited during the prosecution of the prior parent application. In accordance with 37 C.F.R. § 1.98(a)(2)(iii), a copy of the above-cited application has not been enclosed, nor has the application been listed on the enclosed Form PTO-

1449. The Examiner is respectfully directed to Patent and Trademark Office files for review of that application.

The information listed on the enclosed Form PTO-1449 was cited in the parent Application No. 08/782,817, and might be deemed pertinent for the reasons given there. The Examiner is respectfully directed to the Patent and Trademark Office files for review of those documents. See 37 C.F.R. § 1.98(d) and MPEP § 609. Additionally, the Examiner is requested to indicate that this information has been considered by initialing the appropriate portion of the enclosed Form PTO-1449.

CONCLUSION

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,


Attorney for Applicants

Registration No. 78,286
29,296

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
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TITLE OF THE INVENTION

INFORMATION PROCESSING APPARATUS, INFORMATION PROCESSING
METHOD, AND INFORMATION PROCESSING SYSTEM

5

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to printer control performed in a network to which a plurality of printers are connected.

Related Background Art

Hitherto, printer control is performed in a network to which a plurality of printers are connected in such a manner that a network printer which is to perform a printing operation and a corresponding printer driver for converting print data received from an application program to a printer language are independently selected.

However, the above known type of printer control presents the following problems. If the printer language of a network printer which is to perform a printing operation does not match the printer language of the selected printer driver, the print data converted according to the printer language which does not fit the network printer is disadvantageously sent to the printer, thus causing

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incorrect character conversion, which prevents a correct printing operation. Further, if a network printer is newly connected to a network, it is necessary that a corresponding new printer driver be installed in each of the client computers on the network.

SUMMARY OF THE INVENTION

Accordingly, in view of the above-described background, it is an object of the present invention to achieve correct printing operations performed while printer languages for individual printers connected to a network are transparent to the user and also to eliminate the need for installing a printer driver into a client computer when a printer is newly connected to a network.

Further objects, features and advantages of the present invention will become apparent from the following description of the preferred embodiments with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of the system configuration by the application of a network print system according to first, second and third embodiments of the present invention;

Fig. 2 is a block diagram illustrating the schematic

configuration of the client computer shown in Fig. 1;

Fig. 3 is a block diagram of the schematic
configuration of the printer shown in Fig. 1;

Fig. 4 is a flow chart illustrating print processing
according to the first embodiment of the present invention;

Fig. 5 is a flow chart illustrating print processing
according to the second embodiment of the present invention;

Fig. 6 is a flow chart illustrating print processing
according to the third embodiment of the present invention;
and

Fig. 7 is a flow chart illustrating print processing
according to the fourth embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[First Embodiment]

Embodiments of the present invention will now be
described with reference to the drawings.

Fig. 1 is a block diagram of a system configuration
formed by the application of a network print system
according to first, second and third embodiments of the
present invention. It will now be assumed in Fig. 1 that n-
number of printers and n-number of print servers are
connected to a network 600. Printers 200, 300 and 400 are
respectively connected to corresponding print servers 250,
350 and 450 by means of printer cables via interfaces (not

shown), and convert print data received from the print servers 250, 350 and 450 to dot image data per page to print it page by page.

5 A client computer 100 is connected to the network 600 by a network cable via an interface (not shown). The client computer 100 is capable of running various programs, such as application programs, and is loaded with a printer driver which serves the function of sending to the network 600 a print job represented by the printer language corresponding to the printer selected to print the data. The printer driver is adapted to support a plurality of printer languages.

15 A file server 500, which is a computer loaded with a network operating system (OS), is connected to the network 600 by a network cable via an interface (unillustrated) so as to store files used in the network 600 and monitor the use of the network 600. The file server 500 also contains print queues 550 for temporarily storing print jobs sent to the individual printers 200, 300 and 400. The number of the
20 print queues 550 corresponds to the number of the printers connected to the network 600. The print servers 250, 350 and 450, which are connected to the network 600 by a network cable via an interface (unillustrated) and are also
25 connected to the printers 200, 300 and 400 by printer cables via interfaces (not shown), sequentially send print job data

to the corresponding printers 200, 300 and 400 if there are any print jobs stored in the associated print queues 550.

In this manner, according to the first through third embodiments, the functions are shared by the client computer 100, the print servers 250, 350 and 450, and the file server 500. This enhances the effective use of the client computer 100 and speeds up printing operations.

Fig. 2 is a block diagram illustrating the schematic configuration of the client computer 100. A central processing unit (CPU) 101 runs programs, such as application programs and printer driver programs, stored in an external memory 112, for example, a hard disk (HD) or a floppy disk (FD), connected to a disk controller (DKC) 107 so as to temporarily store in a RAM 102 information and files required for running the programs. The CPU 101 also controls various devices connected to a system bus 104.

A program ROM contained in a ROM 103 stores command information for running control programs, as illustrated by the flow charts of Figs. 4, 5 and 6, stored in the CPU 101. Font data used in the above-described document processing is stored in a font ROM; and various data (for example, template data) is stored in a data ROM. The RAM 102 serves as a main storage device and a work area for the CPU 101.

A keyboard controller (KBC) 105 controls inputs from a keyboard 110 and from a pointing device (not shown). A CRT

controller (CRTC) 106 controls the display of a CRT display (CRT) 111. The disk controller (DKC) 107 controls access to and from the external memory 112, such as a hard disk (HD) or a floppy disk (FD), which stores boot programs, application programs, printer driver programs, font data, user files, edit files, etc.

An external input/output interface 108 serves as an interface through which the printers 200, 300 and 400 are controlled via an external input device 113 and the network 600. A printer controller (PRTC) 109 equivalent to the aforescribed printer driver serves the function of transmitting to the network 600 a print job indicated by a printer language corresponding to a printer selected among the printers 200, 300 and 400 by an application program.

Fig. 3 is a block diagram illustrating the schematic configuration of each of the printers 200, 300 and 400. In the first through third embodiments, laser beam printers (LBP) are used as the printers 200, 300 and 400. However, other types of printers, such as bubble-jet printers and ink-jet printers, may be used as long as they have sufficient memory capacity to develop print data to a dot image and perform printing operations based on a predetermined printer language.

Contained in the printers 200, 300 and 400 shown in Fig. 3 is a printer control unit 230 for controlling the

overall LBPs 200, 300 and 400 and also for analyzing
character information received from the print servers 250,
350 and 450. A printer CPU 211 exercises overall control,
based on control programs stored in a program ROM of a ROM
213, of access to and from various devices connected to a
5 system bus 214 so as to output an image signal as output
information to a print section (printer engine) 218
connected to the system bus 214 via a print-section
interface 216. The control programs and other programs run
by the CPU 211 are stored, as described above, in the
program ROM of the ROM 213. Font data used for generating
the above output information is stored in a font ROM; and
information used by the print servers 250, 350 and 450 is
stored in a data ROM if a printer without an external memory
15 219, such as a hard disk, is employed.

The CPU 211 is constructed to inform the print servers
250, 350 and 450 of the information contained in the
corresponding printers 200, 300 and 400 via an input device
215. A RAM 212, which functions as a main storage device
20 and a work area for the CPU 211, and its memory capacity is
expandable by the use of an option RAM connected to an add-
in port (not shown). The RAM 212 is used as an output-
information expansion area, an environment-data storage
area, an a non-volatile RAM (NVRAM), or the like. A disk
25 controller (DKC) 217 controls access to and from the above-

described external memory 219, such as a hard disk (HD) or an IC card. The external memory 219 is removably connected as an option and stores font data, emulation programs, form data, etc. An operation unit 201 contains various types of operation switches and LED displays.

The number of the aforescribed external memory 219 is not restricted to one, and a plurality of external memories 219 may be provided, connectable to a plurality of option cards in addition to built-in fonts. The external memory 219 may be provided with an NVRAM (unillustrated) to store printer-mode setting information received from the operation unit 201.

The file server 500 is similar to the client computer 100 in its internal configuration as illustrated in Fig. 2. The file server 500 manages the network 600 by storing files used in the network 600 in a hard disk (not shown). Moreover, the print queues 550 associated with the printers 200, 300 and 400 are formed on the hard disk to temporarily store print jobs received from the client computer 100 in the file format. More than one hard disk and one disk controller 217 may be provided to ensure the reliability of the network 600.

The internal configurations of the print servers 250, 350 and 450 are also similar to the construction of the client computer 100 shown in Fig. 2. If there is any print

data stored in the print queues 550, the print servers 250, 350 and 450 respectively extract the print jobs using the external input device 113 and respectively send the print data to the printers 200, 300 and 400 through printer cables connected to the printer controller (PRTC) 109. Computers are not necessarily used as print servers 250, 350 and 450, and mere print server functions may suffice. Alternatively, the print servers 250, 350 and 450 may be built into the corresponding printers 200, 300 and 400.

An explanation will now be given of the print processing in the first embodiment with reference to the flow chart of Fig. 4. In this embodiment, the program for executing print processing by the CPU 101 is contained in the printer driver program, which is stored in a storage medium, i.e., a floppy disk, through which the program is readable by the computer. This program is then stored in an external memory, such as a hard disk. Alternatively, it may be stored in advance in the program ROM of the ROM 103 contained in the client computer 100.

A storage medium for supplying program codes may use not only the above-described floppy disk or the ROM, but also an optical disk, a magneto-optical disk, a hard disk, a CD-ROM, magnetic tape, a non-volatile memory card, or the like. With this arrangement, the program codes per se read from the storage medium can implement a novel feature of the

present invention, and thus, the storage medium for storing such program codes can constitute the present invention.

A reference will first be made to Fig. 4. In S1, the CPU 101 of the client computer 100 runs an application program to generate data to be printed and stores it in the RAM 102 and in a hard disk. The CPU 101 then suspends the processing of the application program and executes the processings in S2 and the following steps. More specifically, the CPU 101 runs a printer driver program and makes a query about the printer language supported by the printer selected from the printers 200, 300 and 400 connected to the network 600 for performing a printing operation. This query may be made to any of the corresponding printer, the print server, or the file server 500. It will now be assumed in this embodiment that the printer selected for performing a printing operation will be the printer 200. In S3, in response to the question asked in S2, the CPU 101 receives a reply concerning the printer language supported by the printer 200 from the printer 200, the print server 250 or the file server 500.

Then, the CPU 101 determines in S4 whether the received printer language is contained in the printer languages supported by the printer driver. If the answer in S4 is yes, the flow proceeds to S5 in which the CPU 101 converts the print data according to the printer language supported

by the printer 200 so that the printer 200 can interpret the data, and sends the converted data to the printer 200. In S6, the CPU 101 ends the printer driver program and restarts the processing of the application program.

5 On the other hand, if it is found in S4 that the printer language supported by the printer 200 is not included in the printer languages supported by the printer driver, the flow proceeds to S7 in which the CPU 101 displays a message indicating the above information on the display and ends the printer driver program and restarts the processing of the application program.

10 In this manner, in the first embodiment, a query is made concerning the printer language of the selected printer to the printer, the associated print server or the file server, and, upon receiving the answer, the print data is sent in the form of the obtained printer language. Thus, the user is able to perform a correct printing operation while the printer languages of the individual printers connected to the network are transparent to the user.

15 [Second Embodiment]

20 Print processing of a second embodiment of the present invention will now be described while referring to the flow chart of Fig. 5. In this embodiment, the program for executing print processing by the CPU 101 is contained in
25 the printer driver program, which is stored in a storage

medium, i.e., a floppy disk, through which the program is readable by the computer. This program is then stored in an external memory, such as a hard disk. Alternatively, it may be stored in advance in the program ROM of the ROM 103 contained in the client computer 100.

In this embodiment, if the printer language supported by a selected printer is not notified by the printer, the corresponding print server or the file server, the CPU 101 instructs the user to select another printer by displaying a message indicating such an instruction.

More specifically, in S101 the CPU 101 of the client computer 100 runs an application program to generate data to be printed and stores it in the RAM 102 and in a hard disk. Then, the CPU 101 suspends the processing of the application program and runs the printer driver program to control the processings in S102 and the following steps. In the interests of simplicity, in this embodiment, as well as in the previous embodiment, the flow of this processing will be explained, assuming that the printer selected for printing is the printer 200.

In S102, the CPU 101 makes a query about the printer language supported by the selected printer 200 to the printer 200, the print server 250 or the file server 500 on the network 600. The CPU 101 then determines in S103 as to whether the printer language supported by the printer 200

has been received, in response to the above query, from the printer 200, the print server 250 or the file server 500. If the answer in S103 is yes, the flow proceeds to S104 in which the CPU 101 judges whether the printer language is included in the printer languages which can be interpreted by the printer driver stored in the external memory 112. If the response in S104 is yes, the flow further proceeds to S105 in which the CPU 101 converts the print data to match the printer language supported by the printer 200 and sends the converted data to the printer 200. Thereafter, in S106 the CPU 101 ends the printer driver program and restarts the processing of the application program.

In contrast, if it is found by the CPU 101 in S104 that the printer language supported by the printer 200 is not interpretable by the printer driver program which executes the program, the flow proceeds to S108 in which the CPU 101 displays on the display that the printer language of the printer 200 is not supported by the printer driver. The CPU 101 then ends the printer driver program and restarts the application program.

Referring back to S103, if the CPU 101 judges that the printer language supported by the printer 200 has not been sent to the client computer 100 from the printer 200, the print server 250 or the file server 500, the CPU 101 instructs the user to select another printer from the

printers 300 and 400 by displaying a message indicating the above instruction. Then, the flow returns to S102.

According to the above description, in the second embodiment, if the printer language is not obtained after making an inquiry about the printer language of the selected printer to the printer, the corresponding print server or the file server, a message is given to the user to indicate that another printer should be selected. This makes it possible for the user to recognize that the printer selected by the user is incorrect, thereby enhancing ease of use.

[Third Embodiment]

An explanation will now be given of print processing of a third embodiment with reference to the flow chart of Fig. 6. In this embodiment, the program for executing print processing by the CPU 101 is contained in the printer driver program, which is stored in a storage medium, i.e., a floppy disk, through which the program is readable by the computer. This program is then stored in an external memory, such as a hard disk. Alternatively, it may be stored in advance in the program ROM of the ROM 103 contained in the client computer 100. For the purpose of brevity, in this embodiment, as well as in the foregoing embodiments, it will now be assumed that the printer 200 is determined as the printer selected for printing.

In this embodiment, if the printer language supported

by the printer 200 is not reported by the printer 200, the
print server 250 or the file server 500, the printer
languages of all of the other printers 300 and 400 on the
network 600 are checked and notified to the user, so that
5 the user can be instructed to choose another printer 300 or
400.

More specifically, in S201 the CPU 101 of the client
computer 100 runs an application program to produce data to
be printed and stores it in the RAM 102 and in a hard disk.
The CPU 101 then suspends the processing of the application
program and runs the printer driver program to control the
processings in S202 and the following steps. Namely, in
S202 the CPU 101 which runs the printer driver program
inquires as to the printer language supported by the printer
200 to the printer 200, the print server 205 or the file
server 500 connected to the network 600. Subsequently, the
CPU 101 makes a determination in S203 whether the printer
language supported by the printer 200 has been received, in
response to the above question in S202, from the printer
200, the print server 250 or the file server 500.

If the response in S203 is yes, the flow proceeds to
S204 in which it is judged as to whether the printer
language is contained in the printer languages interpretable
by the printer driver program. If the answer in S204 is
25 yes, the flow further proceeds to S205 in which the print

data is converted to match the printer language of the selected printer 200 and sends the converted data to the printer 200. Then, in S206 the CPU 101 ends the printer driver program and restarts the application program.

5 On the other hand, if the CPU 101 judges in S204 that the received printer language is not interpretable by the printer driver program, the flow proceeds to S208 in which the CPU 101 displays on the display that the printer language is not supported by the printer driver. The CPU 101 then ends the printer driver program and restarts the application program.

10 If it is found in S203 that the printer language supported by the printer 200 has not been reported by the printer 200, the print server 250 or the file server 500, the printer languages of all of the other printers 300 and 400 on the network 600 are checked and notified to the user. An instruction is then provided to the user to select another printer 300 or 400. The flow then returns to S202.

15 According to the above description, in this embodiment, 20 if the printer language is not reported after an inquiry is made about the printer language supported by the selected printer to the printer, the print server or the file server, the CPU 101 instructs the user to select another printer by displaying the printer languages of all of the other 25 printers connected to the network. It is thus possible for

the user to perform a printing operation with a desired printer even if the printer languages of the individual printers connected to the network are totally unknown to the user.

5 As discussed above, according to this embodiment, a query is made concerning the printer language of the selected printer to the printer, the print server or the file server, and the print data is converted to match the received printer language and sent to the printer. This makes it possible to perform a correct printing operation while the printer languages of the individual printers connected to the network are transparent to the user.

[Fourth Embodiment]

15 A description will now be given with reference to the flow chart of Fig. 7 of print processing according to a fourth embodiment. In this embodiment, if a network printer is newly connected to a network, a client computer identifies the printer language supported by the new network printer.

20 More specifically, the client computer 100 identifies a network printer 700 (not shown) newly connected to the network 600 and inquires as to this printer 700 about its printer language. In this embodiment, the client computer 100 is adapted to store the devices, such as the print
25 servers, the printer file server and the client computer,

connected to the network 600 in the storage means, such as the RAM 102 or the external memory 112.

In S301, the CPU 101 of the client computer 100 determines the presence or absence of a new printer connected to the network 600 by inquiring about management information base (MIB) information to the network 600. If the CPU 101 identifies, upon a determination in S302, the presence of a new printer on the network 600, the flow proceeds to S303. If it is found in S302 that the presence of a new printer is denied, the flow returns to S301 by means such as providing a timer to count for a predetermined duration. Also, the processing in S301 may be executed only when the user gives a command instruction through the client computer 100.

In S303, the CPU 101 makes a query to the printer newly connected to the network 600, i.e., the printer 700 in this embodiment, about its printer language. It is then judged in S304 whether the printer language supported by the printer 700 has been sent in response to the above query.

If the answer in S304 is yes, the flow proceeds to S305 in which a determination is made as to whether the received printer language is contained in the printer languages interpretable by the printer driver program. If the answer in S305 is yes, the flow further proceeds to S306 in which the CPU 101 stores the printer identifying information, such

as the printer language supported by the printer 700, in the storage means, such as the external memory 112 or in the RAM 102 within the client computer 100. The CPU 101 then ends this processing.

5 In contrast, if it is found in S304 that the printer language supported by the printer 700 has not been sent in response to the question asked in S303, the CPU 101 displays in S307 on the display a message indicating the presence of an unidentifiable printer and then ends this processing.

10 If it is found in S305 that the received printer language is not interpretable by the printer driver program, the CPU 101 displays in S308 a message indicating such information on the display so as to end this processing.

15 According to the above description, in the fourth embodiment, the CPU 101 checks whether there is any printer newly connected to the network, and if the answer is yes, a query is made to the printer about its printer language. In response to this question, if it is determined that the received printer language is interpretable by the printer driver which executes this program, printer information, for
20 example, the printer language, is stored in storage means within the client computer. This can obviate the need for the user to install a printer driver compatible with the new printer into the client computer.

25 As will be clearly understood from the foregoing

description, the present invention offers the following advantages. Even if a printer is newly connected to a network, there is no need for the user to install a printer driver compatible with the new printer into all of the client computers on the network. Instead, the client computer can automatically determine whether a printer is newly connected to the network and further identify printer information, such as the printer language supported by the new printer, and store it in the client computer.

While the present invention has been described with reference to what are presently considered to be the preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, the invention is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

WHAT IS CLAIMED IS:

1. An information processing apparatus comprising:
5 inquiry means for making a query concerning a printer
language supported by a printer; and

transmission means for transmitting to said printer
print data converted to be interpretable by the printer
language received in response to the query made by said
inquiry means.

2. An information processing apparatus according to
claim 1, wherein said inquiry means makes a query when a
printer is connected to said information processing
15 apparatus.

3. An information processing apparatus according to
claim 2, further comprising storage means for storing the
printer language received in response to the query made by
20 said inquiry means.

4. An information processing apparatus according to
claim 1, wherein said information processing apparatus is
connected to a network to which any of a client computer, a
25 printer, a print server, and a file server provided with a

print queue is connected, and said inquiry means and said transmission means are constructed on said information processing apparatus.

5 5. An information processing apparatus according to claim 4, wherein said inquiry means makes a query when a printer is connected to said network.

10 6. An information processing apparatus according to claim 5, further comprising storage means for storing the printer language received in response to the query made by said inquiry means.

15 7. An information processing apparatus according to claim 4, wherein said transmission means transmits via said print queue print data converted to match the printer language.

20 8. An information processing apparatus according to claim 1, wherein said information processing apparatus is connected to a plurality of printers, said apparatus further comprising instruction means for providing an instruction to select another printer if the printer language supported by the selected printer is not received in response to the
25 query made by said inquiry means.

9. An information processing apparatus according to claim 8, wherein said information processing apparatus is connected to a network to which any of a client computer, printers, a print server, a file server provided with a print queue is connected, and said inquiry means, said transmission means and said instruction means are constructed on said information processing apparatus.

10. An information processing apparatus according to claim 9, wherein said transmission means transmits via said print queue print data converted to match said printer language.

11. An information processing apparatus according to claim 8, wherein said instruction means provides an instruction to select another printer by displaying a message.

12. An information processing apparatus according to claim 11, wherein said instruction means provides an instruction to select another printer by displaying a message indicating that another printer is to be selected.

13. An information processing apparatus according to

claim 11, wherein said instruction means provides an instruction to select another printer by displaying all of the printer languages supported by all of the printers connected to said network.

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14. An information processing apparatus according to claim 4, wherein said inquiry means makes a query concerning the printer language to one of the printer selected to perform a printing operation, the print server connected to said printer, and the file server.

15. An information processing method comprising:
an inquiry step for making a query concerning a printer language supported by a printer; and

a transmission step for transmitting to said printer print data converted to be interpretable according to the printer language received in response to the query made in said inquiry step.

16. An information processing method according to claim 15, wherein said inquiry step makes a query, in a network having any of a client computer, a printer, a print server, and a file server provided with a print queue, when the printer is connected to said network.

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17. An information processing method according to claim 16, further comprising a storage step for storing the printer language received in response to the query made in said inquiry step.

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18. An information processing method according to claim 15, further comprising an instruction step for providing an instruction to select another printer if the printer language supported by said information processing method is not received in response to the query made in said inquiry step.

19. An information processing method according to claim 18, wherein said instruction step provides an instruction to select another printer by displaying a message.

20. An information processing method according to claim 19, wherein said instruction step provides an instruction to select another printer by displaying a message indicating that another printer is to be selected.

21. An information processing method according to claim 19, wherein said instruction step provides an instruction to select another printer by displaying all of

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the printer languages supported by all of the printers.

22. An information processing method according to claim 15, wherein said inquiry step makes a query, in a network having any of a client computer, a printer, a print server, and a file server provided with a print queue, concerning the printer language to one of the printer selected to perform a printing operation, the print server connected to said printer, and the file server.

23. An information processing system comprising:
inquiry means for making a query concerning a printer language supported by a printer;

notification means for notifying the printer language received in response to the query made by said inquiry means; and

transmission means for transmitting to said printer print data converted to be interpretable by the printer language received by said notification means.

24. An information processing system according to claim 23, wherein said inquiry means makes a query when the printer is connected to said information processing system.

25. An information processing system according to

claim 24, further comprising storage means for storing the printer language received in response to the query made by said inquiry means.

5 26. An information processing system according to claim 23, wherein said information processing system comprises a network to which any of a client computer, a printer, a print server, and a file server provided with a print queue is connected, and said inquiry means and said transmission means are constructed on said client computer.

10 27. An information processing system according to claim 26, wherein said inquiry means makes a query when the printer is connected to said network.

15 28. An information processing system according to claim 27, further comprising storage means for storing the printer language received in response to the query made by said inquiry means.

20 29. An information processing system according to claim 26, wherein said transmission means transmits via said print queue print data converted to match the printer language.

30. An information processing system according to claim 26, wherein said notification means is constructed on any one type of devices selected from the printer, the print server and the file server.

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31. An information processing system according to claim 23, further comprising instruction means for providing an instruction to select another printer if the printer language supported by said information processing system is not received in response to the query made by said inquiry means.

32. An information processing system according to claim 31, wherein said information processing system comprises a network to which any of a client computer, a printer, a print server, and a file server provided with a print queue is connected, and said inquiry means, said transmission means and said instruction means are constructed on said client computer, while said notification means is constructed on any one type of devices selected from the printer, the print server and the file server.

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33. An information processing system according to claim 32, wherein said transmission means transmits via said print queue print data converted to match the printer

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language.

34. An information processing system according to
claim 31, wherein said instruction means provides an
instruction to select another printer by displaying a
message.

35. An information processing system according to
claim 34, wherein said instruction means provides an
instruction to select another printer by displaying a
message indicating that another printer is to be selected.

36. An information processing system according to
claim 34, wherein said instruction means provides an
instruction to select another printer by displaying all of
the printer languages of all of the printers connected to
said network.

37. A storage medium for storing a program readable
by a computer, said program comprising:

an inquiry step for making a query concerning a printer
language supported by a printer selected to perform a
printing operation; and

a transmission step for transmitting to said printer
print data converted to be interpretable by the printer

language received in response to the query made in said inquiry step.

38. A storage medium according to claim 37, wherein
5 said inquiry step makes a query, in a network to which any of a client computer, a printer, a print server and a file server provided with a print queue is connected, when the printer is connected to said network.

39. A storage medium according to claim 38, further
10 comprising a storage step for storing the printer language received in response to the query made in said inquiry step.

40. A storage medium according to claim 37, further
15 comprising an instruction step for providing an instruction to select another printer if the printer language supported by said printer is not received in response to the query made in said inquiry step.

20 41. A storage medium according to claim 40, wherein said instruction step provides an instruction to select another printer by displaying a message.

25 42. A storage medium according to claim 41, wherein said instruction step provides an instruction to select

another printer by displaying a message indicating that another printer is to be selected.

43. A storage medium according to claim 41, wherein
5 said instruction step provides an instruction to select another printer by displaying all of the printer languages supported by all of the connected printers.

44. A storage medium according to claim 37, wherein
10 said inquiry step makes a query, in a network having any of a client computer, a printer, a print server, and a file server provided with a print queue, concerning the printer language to any one type of devices selected from the
15 printer, the print server and the file server.

ABSTRACT OF THE DISCLOSURE

An information processing apparatus is disclosed. A host computer makes a query to a selected printer connected to a network concerning a printer language supported by the printer. Then, print data is converted to match the printer language received in response to the above query, and the converted data is transmitted to the printer. This enables the user to achieve correct printing operations while the printer languages of the individual printers connected to the network are transparent to the user.

FIG. 1

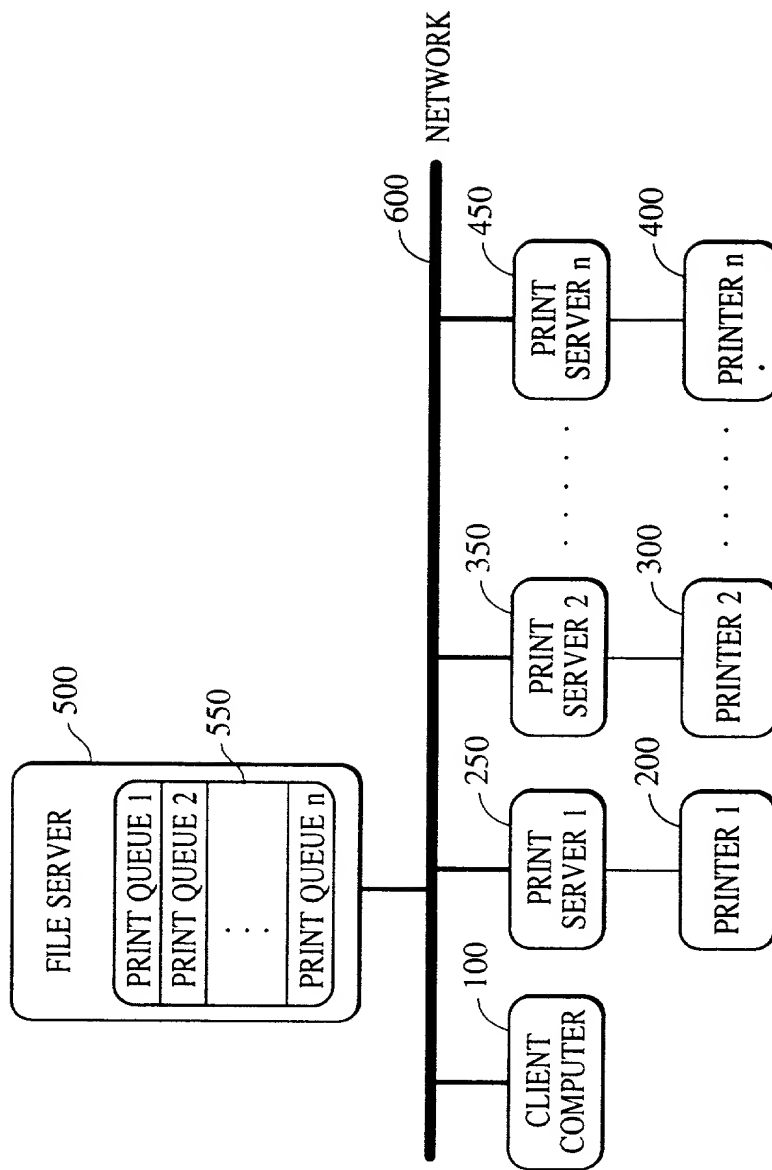


FIG. 2

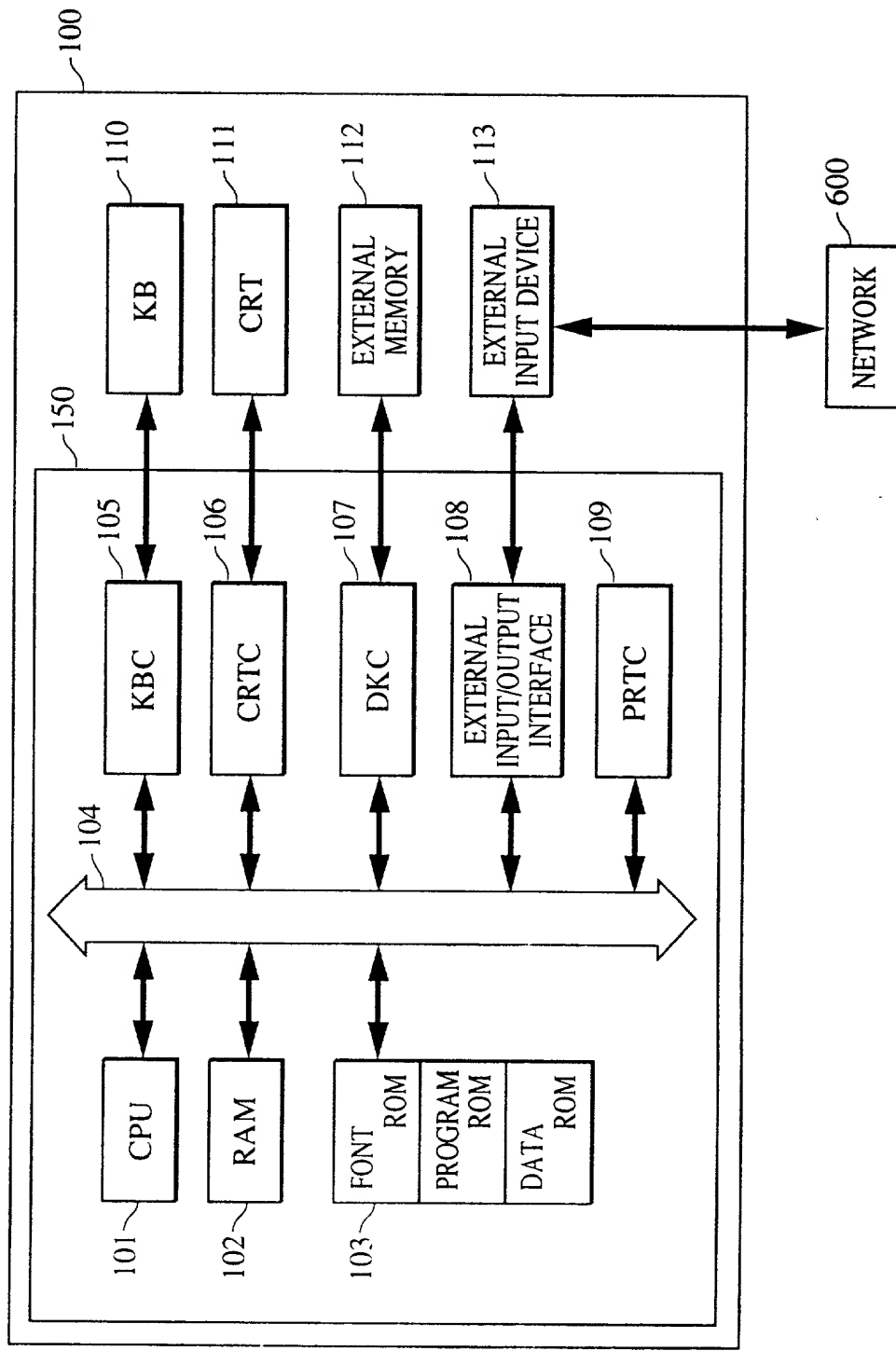


FIG. 3

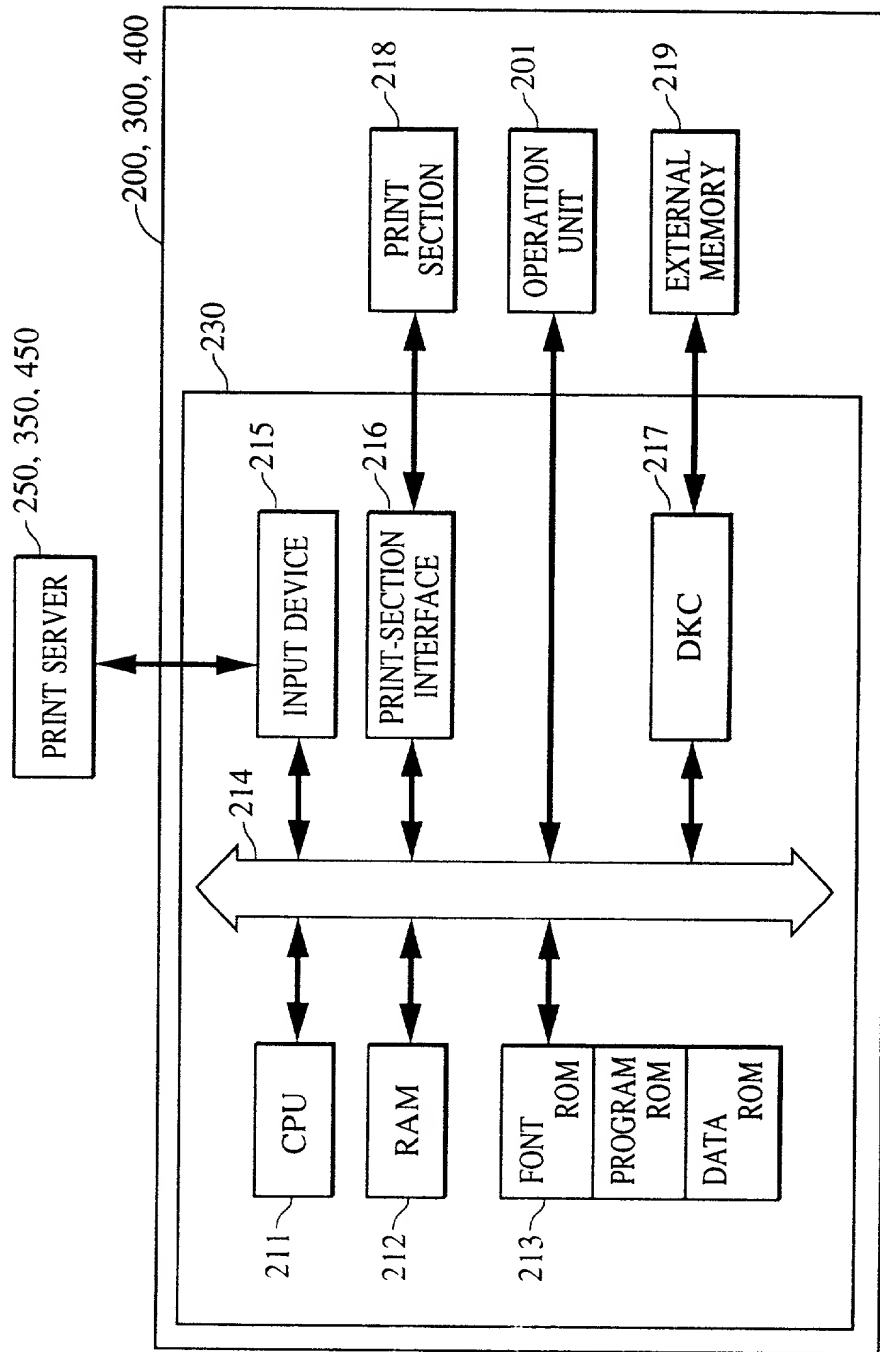


FIG. 4

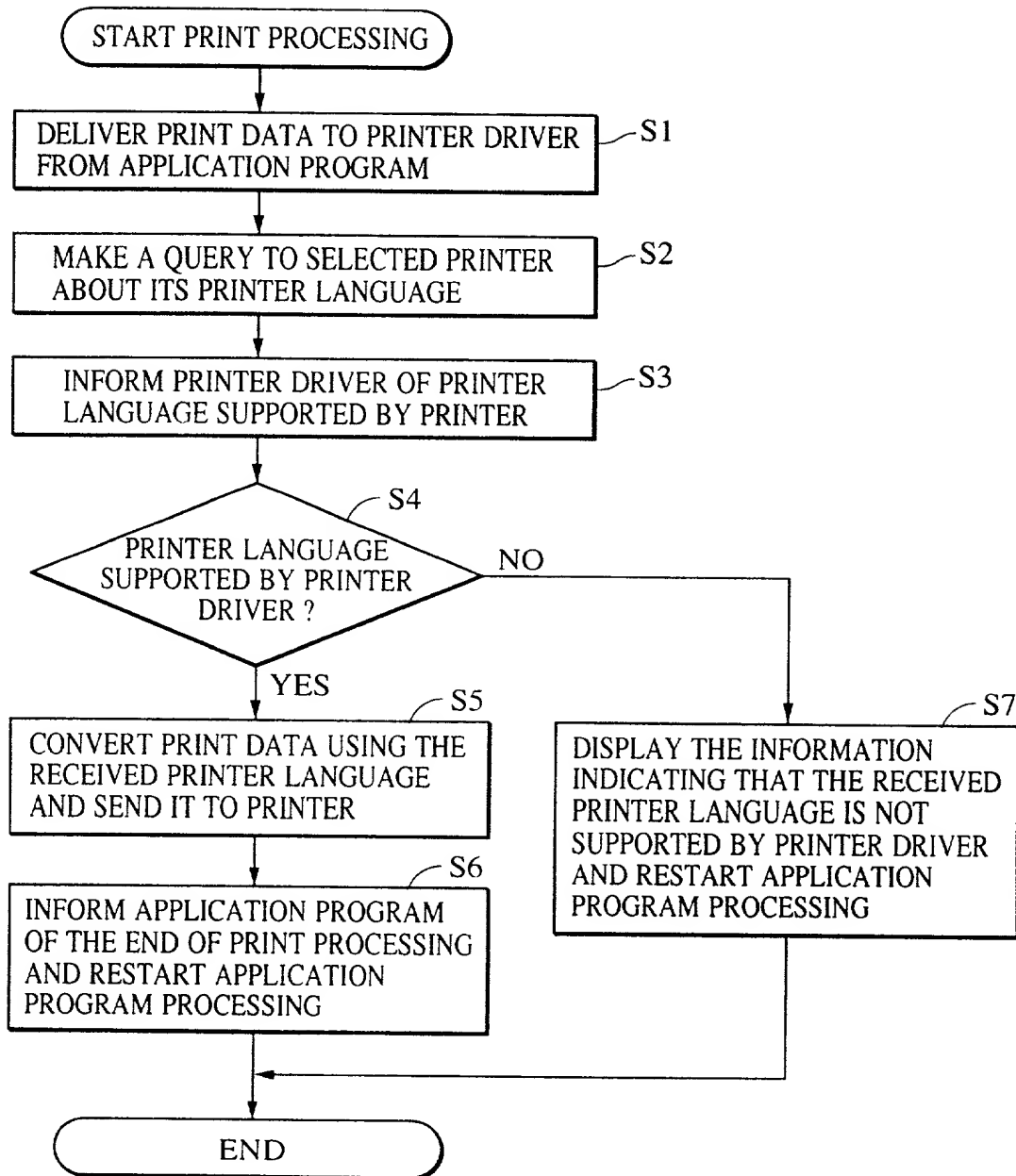


FIG. 5

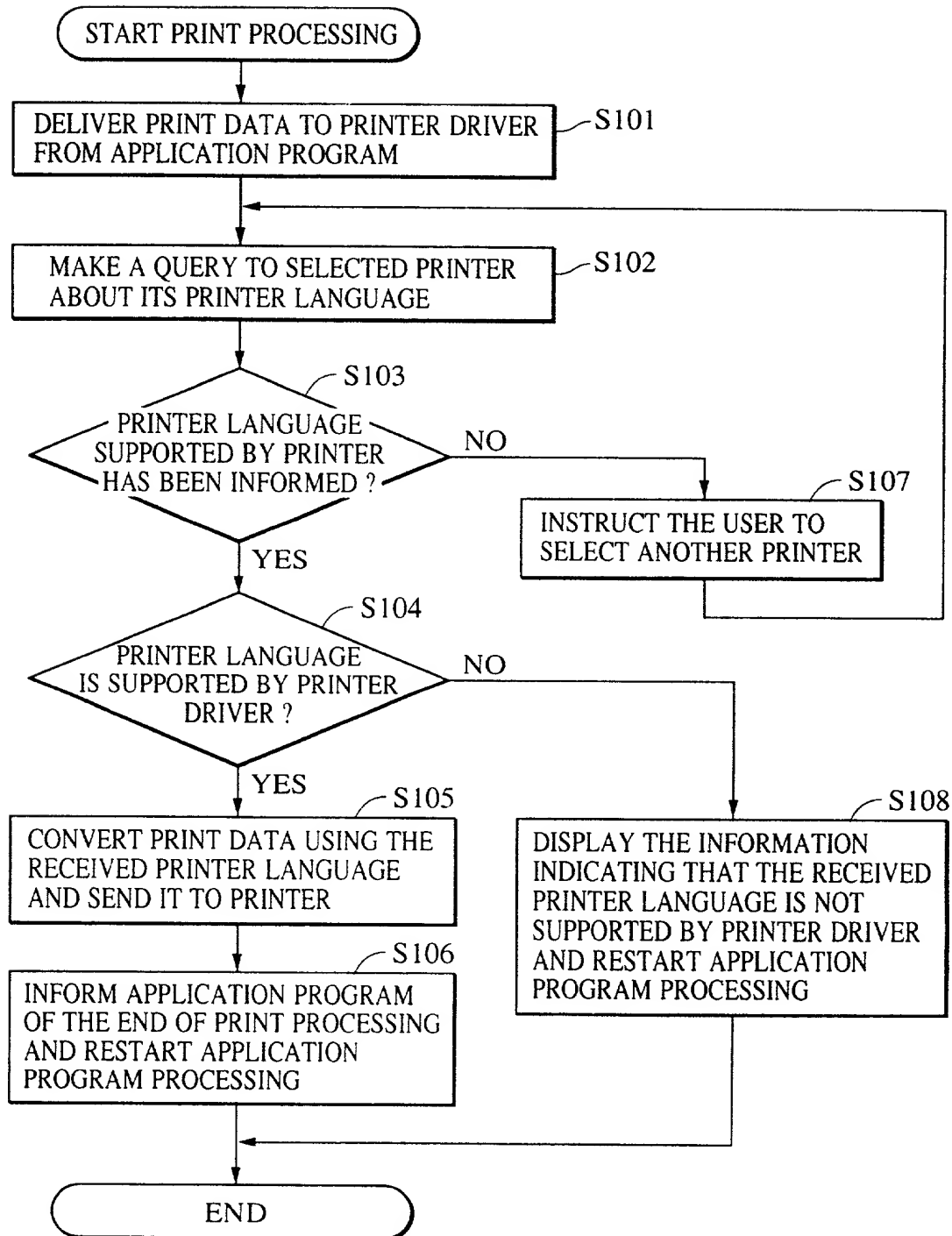


FIG. 6

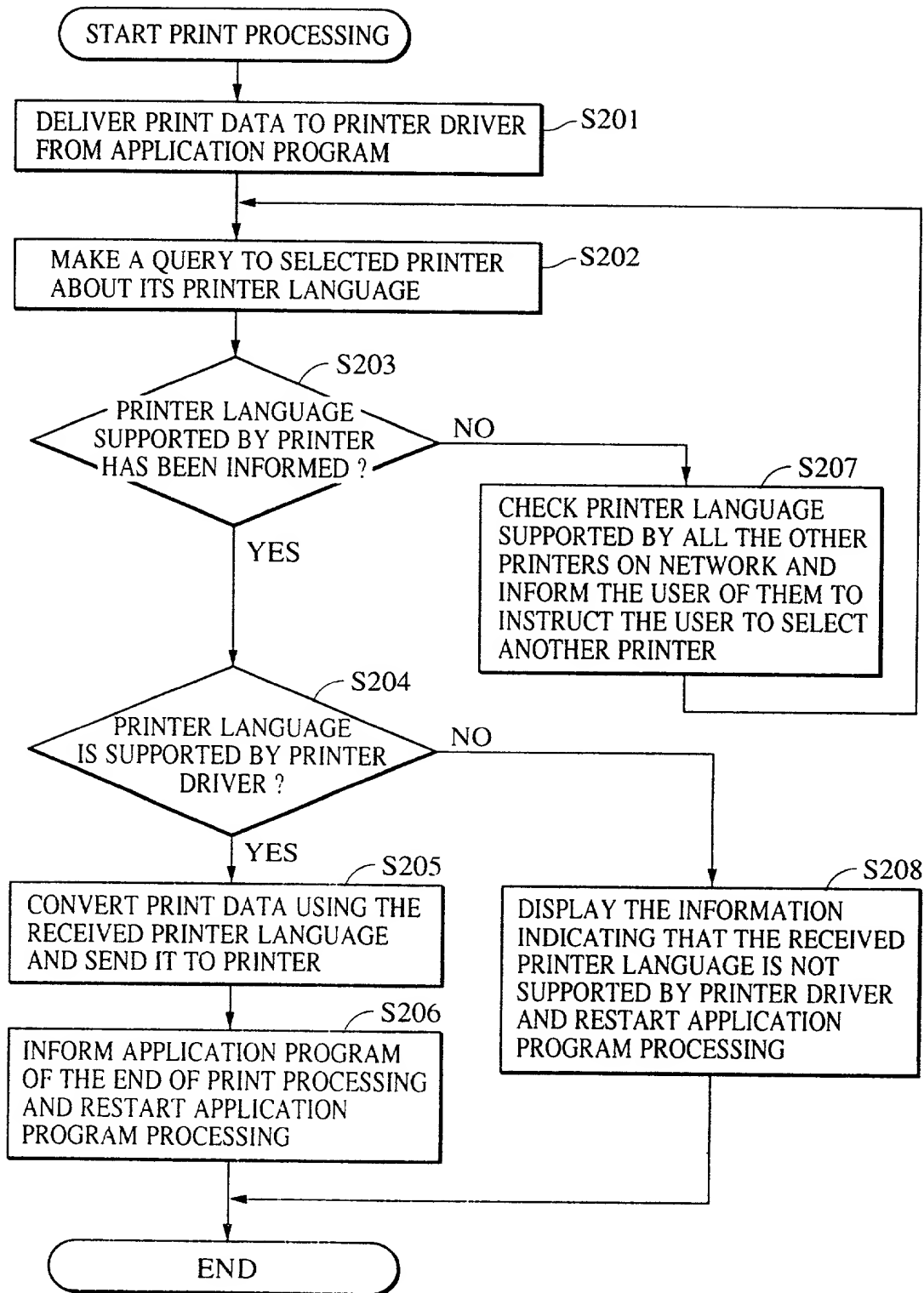
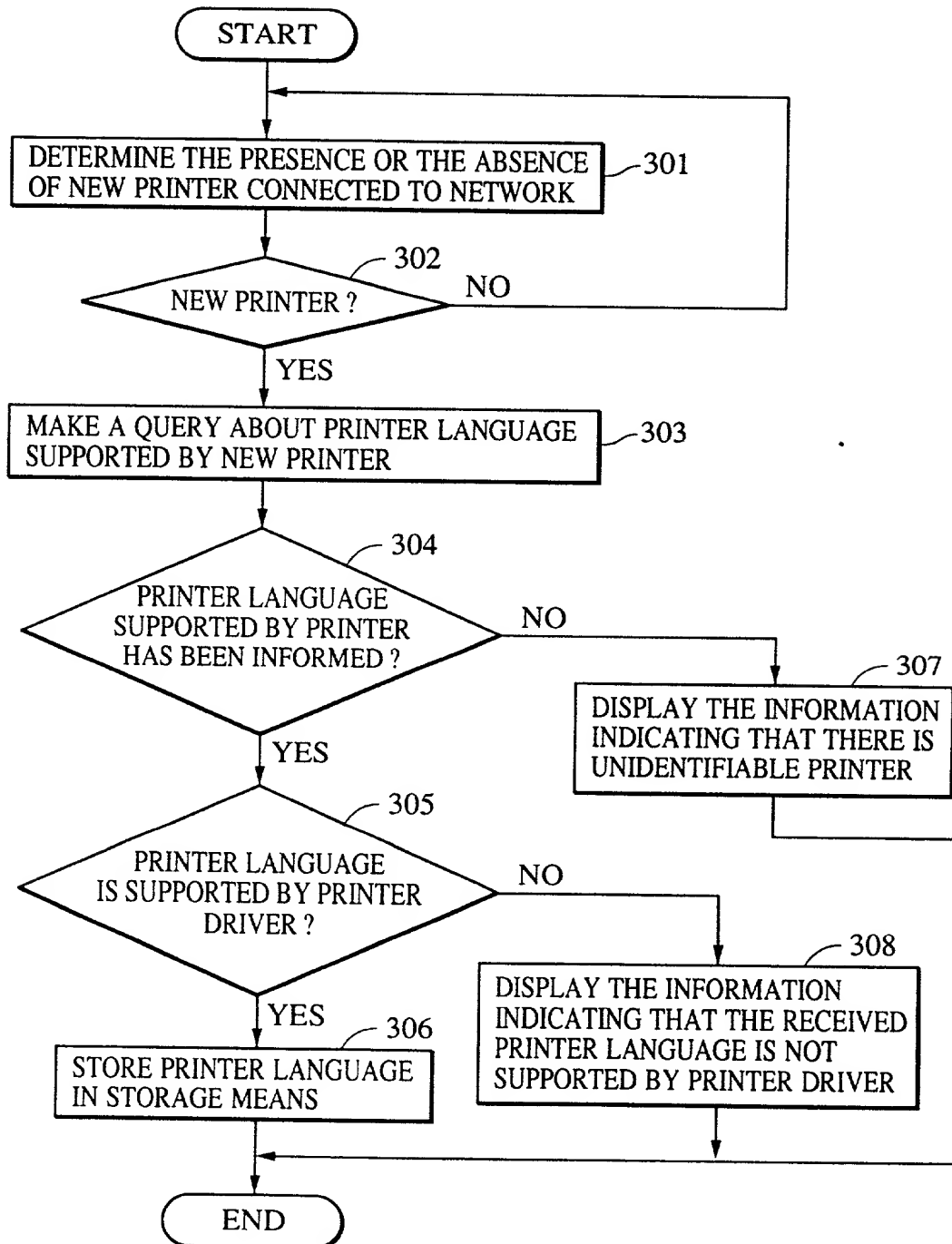


FIG. 7



COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled INFORMATION PROCESSING APPARATUS, INFORMATION PROCESSING METHOD, AND INFORMATION PROCESSING SYSTEM,

the specification of which ☒ is attached hereto. ☐ was filed on _____ as Application No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign applications for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Country	Application No.	Filed (Day/Mo./Yr.)	(Yes/No) Priority Claimed
Japan	023488/1996(Pat.)	18/January/1996	Yes

I hereby appoint Joseph M. Fitzpatrick (Registration No. 17,398), Lawrence F. Scinto (Registration No. 18,973), William J. Brunet (Registration No. 20,452), Robert L. Baechtold (Registration No. 20,860), John A. O'Brien (Registration No. 24,367), John A. Krause (Registration No. 24,613), Henry J. Renk (Registration No. 25,499), Peter Saxon (Registration No. 24,947), Anthony M. Zupcic (Registration No. 27,276), Charles P. Baker (Registration No. 26,702), Stevan J. Bosses (Registration No. 22,291), Edward E. Vassallo (Registration No. 29,117), Ronald A. Clayton (Registration No. 26,718), Lawrence A. Stahl (Registration No. 30,110), Laura A. Bauer (Registration No. 29,767), Leonard P. Diana (Registration No. 29,296), David M. Quinlan (Registration No. 26,641), Nicholas N. Kallas (Registration No. 31,530), William M. Wannisky (Registration No. 28,373), Lawrence S. Perry (Registration No. 31,865), Robert H. Fischer (Registration No. 30,051), Christopher Philip Wrist (Registration No. 32,078), Gary M. Jacobs (Registration No. 28,861), Michael K. O'Neill (Registration No. 32,622), Bruce C. Haas (Registration No. 32,734), Scott K. Reed (Registration No. 32,433), Scott D. Malpede (Registration No. 32,533), Fredrick M. Zullo (Registration No. 32,452), Richard P. Bauer (Registration No. 31,588), Warren E. Olsen (Registration No. 27,290), Abigail F. Cousins (Registration No. 29,292), Steven E. Warner (Registration No. 33,326), Thomas J. O'Connell (Registration No. 33,202), Penina Wollman (Registration No. 30,816), David L. Schaeffer (Registration No. 32,716), Jack S. Cubert (Registration No. 24,245), Mark A. Williamson (Registration No. 33,628), John T. Whelan (Registration No. 32,448), Jean K. Dudek (Registration No. 30,938), Raymond R. Mandra (Registration No. 34,382), Dominick A. Conde (Registration No. 33,856), Steven C. Bauman (Registration No. 33,832), Pasquale A. Razzano (Reg. No. 25,512), John W. Behringer (Registration No. 23,086), Robert C. Kline (Registration No. 17,739), Mark J. Itri (Registration No. 36,171), William C. Hwang (Registration No. 36,169), Michael P. Sandonato (Registration No. 35,345), Jack M. Arnold (Registration No. 25,823), John D. Carlin (Registration No. 37,292), Daniel S. Glueck (Registration No. 37,838), Victor J. Geraci (Registration No. 38,157), Joseph W. Ragusa (Registration No. 38,586), Brian L. Klock (Registration No. 36,570), Anne M. Maher (Registration No. 38,231), William J. Zak, Jr. (Registration No. 38,668), Thomas D. Pease (Registration No. 35,317), Bruce M. Wexler (Registration No. 35,409), and Robert S. Mayer (Registration No. 38,544) my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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COMBINED DECLARATION AND POWER OF ATTORNEY
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(Page 2)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Second Inventor's signature _____

Date _____ Citizen/Subject of _____

Residence _____

Post Office Address _____

Full Name of Third Joint Inventor, if any _____

Third Inventor's signature _____

Date _____ Citizen/Subject of _____

Residence _____

Post Office Address _____

Full Name of Fourth Joint Inventor, if any _____

Fourth Inventor's signature _____

Date _____ Citizen/Subject of _____

Residence _____

Post Office Address _____